Revue suisse de Zoologie, vol. hors série: 531-536; août 1996

Salticidae (Araneae) distribution over Indonesian and Pacific Islands

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Salticidae (Araneae) distribution over Indonesian and Pacific Islands. - Indonesian and the Pacific Islands is a classical area for biogeographic considerations. Unfortunately the taxonomy of Salticidae from that area is poorly known. Preliminary results of three rich collections indicate that the majority of Polynesian and Micronesian genera is not isolated from those of Indonesian islands, so we can speak of "island genera". Out of 87 island genera examined, 72% have representatives on Asian mainland (some also on Australia), in contrast to 15% having only Australian or New Guinean representatives. About 13% of genera are limited to islands, without relatives on either continent, as far as known. A striking aspect of the island Salticidae fauna is an extensive island type speciation on archipelagoes of smaller islands and a continental type on larger islands. There are no endemic genera on small islands.

Key-words: Araneae – biogeography – Indonesia – Micronesia –Polynesia – Pacific – Salticidae – spiders.

INTRODUCTION

Many opinions have been expressed about the spider fauna of islands: Berland 1934, Lehtinen 1980, Zabka 1988, 1990, 1993, 1994. To draw conclusions unbiased by previous views, I had access to collection of exceptional value, far more complete and rich than those available to the previous authors. The most important collections I studied were: J.W. Berry - J. Beatty collection from Pacific Islands, Ch. Deeleman-Reinhold collection from SE Asia and a collection of ant-like Salticidae from Malaysia, constituted by M. Edmunds. Taxonomic descriptions of species from the Pacific Island were prepared and deposited for press (Berry *et al.*, in press, a, b, and in preparation); the Indonesian and SE Asian collections were sorted out and the species will be described in due time.

Manuscript accepted 09.09.1995.
Proceedings of the XIIIth International Congress of Arachnology, Geneva, 3-8-IX.1995.

RESULTS AND DISCUSSION

The study of island fauna is full of surprises. Seemingly widespread species in some genera appear, when carefully examined, to present dozens (possibly even more) of closely related distinct species. It just seems that every small island has a species of ist own, due to allopatric — island speciation. This calls for a special attention: after identification of the genus one has to search for specific differences in similarly looking specimens from every island.

Other genera, however, appear so differentiated that their relationships become clear only after a detailed analysis. This may be due to the continental type speciation, taking place on larger islands, as Viti Levu, not to mention even that on real continents. A good example of such an advanced differentiation is provided by the genus *Sobasina* (for description see Berry et al., in preparation).

The distribution of genera shows their geographical provenance and relationships with faunas of other areas (see enclosed table). There are only few endemic genera, those mentioned up to now turned out to be misidentifications. The Salticidae faunas of Polynesia, Micronesia and Indonesia seem to have clearly Oriental relationships, some of their genera occurring also in such distant areas as the Palaearctic Far East, Central Asia, the Mediterranean and Africa. My analysis does not include New Guinea, Melanesia, New Zealand and Hawaii, the characteristics of these faunas are unknown to me. On the other hand, a number of Oriental genera also reaches Australia and are of zoogeographical significance.

TABLE 1

Distribution of Salticidae genera on South Pacific and Indonesian islands

Abbreviations: Af – Africa, Au – Australia, Fj – Fiji, Me – Melanesia, Mi – Micronesia, Mo – Moluccas + Sulawesi, NG – New Guinea, NZ – New Zealand, OM – Oriental mainland, Pal – Palaearctic; Po – remaining Polynesia, Sa – Samoa and Tonga, SG – Greater Sunda Is., SL – Lesser Sunda Is., Ta – Tahiti, citrop – circumtropical. Occurrence of genera: + – catalogue data (PRÓSZYŃSKI 1995), x – occurrence confirmed on studied collection, X – genus previously unknown from the island.

Genus	Au	NG	NZ	Me	Ta	Sa	Fj	Po	Mi	Mo	SL	SG	OM	Af	Pal	other
Omoedus	+	+					X			+						
Trite	+		+	+		+		x	x							
Zenodorus	+	+		+			X	+	X	+						
Palpelius	+	+		+		X		X	+		+					
Ascyltus	+	+		+		+		x		+		x				Hawaii
Holoplatys	+		+	+					X			+				
Ergane	+								x			x				
Servaea	+											x				
Damoetas	+										X	X				
Ptocasius	+											+	x			
Mintonia	+											x	+			
Bathippus	+	x								+		x	x			
Bavia	+	x			x		x	x	x	x		x	x			
Rhene	+	+					+			x		x	+	+	+	Hawaii
Cytaea	x	x					x	x	x	x	x	x	+			

Genus	Au	NG	NZ	Me	Ta	Sa	Fj	Po	Mi	Mo	SL	SG	OM	Af	Pal	other
Euryatus	+	+							+	x	X	X	X			
Plotius	+	+								+	x	x	+			
Diolenius	+	+								x		x	x			
Hasarius	+	+			+		x	x	x	+	x	+	x	+	+	citrop
Menemerus	+	x					x	x	x			x	x	+	+	citrop
Plexippus	+	+					x	x	x	+	X	x	x	x	x	citrop
Bianor	+						X		X		X	x	+	+	+	
Euophrys	x						X		X			X	+	+	+	
Myrmarachne	+						X	+	X	X	x	x	x	+	+	
Pseudicius	+						X	x	x			x	x	+	+	
Evarcha	+							+	X		x	x	x	+	+	
Thyene	+										x	X	+	+	+	
Harmochirus	+										X		+	+	+	
Hyllus	+									+	x	x	x	+		
Cosmophasis		+					X		x	x	x	+	x	+		
Cocalodes		+						+		+		x				
Thorelliola		+						x	X	x		+				
Thiania		+								+	X	x	x			Hawaii
Telamonia		+								+	x	x	x	+	+	
Poecilorchestes		+										X				
Donoessus		X										x	X			
Chalcolecta		+											+			
Furculattus		x														
Sobasina				+			X	X	X	X			X			
Athamas				+	x	x		x	X	X						
Efate				+			X	x	X							
Modunda					Marquesas									+		Hawaii
Flacillula						+		x	X			+				
Gen.n. [I]							X									
Gen.n. [B]							X									
Artabrus									+		X	x				
Ligurra									X		X	+	X			
Phintella									X	X	x	X	X		+	
Carrhotus										+	X	x	x		+	
Epeus										X	X	x	x		+	
Epocilla										+		x	x		+	Hawaii
Siler										X	X	+	x		+	
Marengo										X	X	X	X	+		
Agorius										x	x	x	x			
Pristobaeus										x	X	X	X			
Viciria										+	X	+	+			
Spartaeus										+	X	+	x			
Orthrus										X		x	X			
Gelotia										+		x	+			
Pystira										+		x	+			
Stertinius										+		x				
Brettus										x		+				
Mantisatta										X	+					
Burmattus											X		+		+	
Asemonea											x	x	+	+		
Belippo											X	X	X	+		
Gedea											X	X	x			
Stergusa											X	X	+			
Onomastus											X	x	x			

Genus	Au	NG	NZ	Me	Ta	Sa	Fj	Po	Mi	Mo	SL	SG	OM	Af	Pal	other
Phaeacius											X	+	+			
Microhasarius											X	+				
Maileus											x					
Phlegra												X	+	+	+	
Plexippoides												X	+		+	
Synagelides												X	x		+	
Langona												X	x	+	+	
Taraxella												x	+			
Mantius												+	x			
Emathis												x	+			
Curubis												X				
Irura												X	+			
Laufeia												x	+			
Nanneus												X	+			
Orisania												X	+			
Orisima												x	+			
Panysinus												x	+			
Pancorius												x	+			

TABLE 2

Number of genera of Salticidae distributed on Pacific Islands
(a sample of 28 genera, cosmopolitic ones not included)

Car = Caroline, Coo = Cook, Fij = Fiji, Mar = Marshall, Maq = Marquises, Gil = Gilbert, NHb = NHebrid + NCaledonia, Pal = Palau, Sal = Salomons, Sam = Samoa, Soc = Society, Ton = Tonga, Tua = Tuamotu, Tub = Tubuai, x- occurrence

	Pal	Car	Mar	Gil	Fij	Ton	Sam	Coo	Soc	Tua	Tb	Maq	Sal	NHb
Peniononus				x										
Phintella		x												
Zenodorus		x			x									
Thorelliola		x	x				x		x			x		
Flacillula		x						x						
Trite		x						x			x			x
Bavia	x	x		x			x	x			x	x	x	
Efate	x	x	x		x									
Athamas	x	x					x			x				x
Sobasina	x				x	x								x
Pseudicius	x		x		x		x							
Cytaea	x				x		x							
Bianor	x				x									
Cosmophasis	x				x									
Euophrys	x				x									
Myrmarachne	x				x									
Palpelius	x													
Evarcha	x													
Holoplatys	x													
Ligurra	x													
Ergane	x													

	Pal	Car	Mar	Gil	Fij	Ton	Sam	Coo	Soc	Tua	Tb	Maq	Sal	NHb
Omoedus					x									
Gen n. (I)					x									
Gen n. (B)					x									
Ascyltus						x								x
Saitis														x
Pseudomaevia								x	x					
Modunda														x
	15 Pal	8 Car	3 Mar	2 Gil	13 Fij	2 Ton	5 Sam	3 Coo	2 Soc	2 Tua	2 Tb	3 Maq	4 Sal	5 NHb

TABLE 3

Summary of distribution of 87 genera of Salticidae known from the South Pacific and Indonesian islands

Restricted to South Pacific Islands	4 = 5%
Restricted to South Pacific and Indonesia	7 = 8%
Reaching Asian mainland, but not Australia	38 = 44%
Reaching both Asian mainland and Australia	16 = 18%
Reaching Australia/New Guinea, but not Asian mainland	13 = 15%
Cosmopolite or widely distributed	9 = 10%

In general, the number of genera occurring on a particular group of islands decreases with increasing distance from the Oriental mainland, as summarized below:

> Greater Sunda = 73; Lesser Sunda = 43; Molucas = 34; the whole Micronesia = 22 (Palau = 15, other Carolines = 7, Gilbert = 2, Marshall = 3); the whole of Polynesia = 21 (Fiji Is. = 13, Tonga = 2, Samoa Is. = 5, Cook Is. = 3, Society Is. = 2, Tuamotu Is. = 2, Tubuai Is. = 2, Marquesas = 3). The data for Melanesia = 6; (Salomon Is. = 1, New Hebrides and New Caledonia = 5) are incomplete and shall not be considered further.

That decrease accords with the classical, textbook correlation between distance, area and number of species, as expressed in the island biogeography model (MACARTHUR & WILSON 1967). However, the detailed distribution patterns do not confirm this general rule. It seems that dispersal from one group of islands to another was not gradual, but occurred in jumps. Genera were settling on one group of islands, omitted the adjacent islands and colonized some more distant islands instead. Human influences might be responsible for it. Dispersal of species within group of islands, however, is rather gradual.

I am unable yet to comment upon the Salticidae fauna of Hawaii in detail. Its striking feature is, however, the occurrence of Oriental (*Epocilla*, *Rhene*, *Thiania*) and North American (*Phidippus*) genera, not known from Micronesia and Polynesia.

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